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3. Manuscripts should be either short papers of less than 3000 words or full-length papers of 3,000-7,000 words, including the cover sheet, an abstract, texts, tables, footnotes, appendixes, and references.
4. The cover sheet should contain ONLY the title of the paper not exceeding 20 words as well as author(s) names written in full as first name first and surname last, heir affiliations and email, telephone/fax contacts of the corresponding author.
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6. The paper format should be organised in the following order: Introduction, Statement of the Problem, Purpose of the Study, Research Questions, Methodology/Materials and Methods, Results, Major Findings, Discussions, Conclusion, Recommendations, References and Appendices (if any).
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## EDITORIAL

The Annals of Technology Education Practitioners Association of Nigeria (ATEPAN) is the official journal of Technology Education Practitioners Association of Nigeria (formerly, Nigerian Association of Teachers of Technology, NATT). The journal aims at disseminating information on Teacher Education in Science, Technology, Engineering and Mathematics as it publishes original empirical and theoretical studies and analyses in education that constitute significant contributions to the improvement of educational processes and outcomes within the scope of our mandate and vision.

The purpose of the journal is to serve as a forum for researchers and other stakeholders to discuss common concerns in science, technology, engineering and mathematics (STEM) education at local, national or transnational levels. The journal has a distinguished editorial board with extensive academic qualifications, ensuring that the journal will maintain high scientific standards and have a broad professional coverage. The journal is an invaluable resource for teachers, counsellors, supervisors, administrators, curriculum planners, and educational researchers as well as students. ATEPAN consolidates the gains of its predecessor: JONATT in its regular quarterly appearance, increasing demand and widespread acceptability across the nation. However, article can be submitted anytime of the year, hence they are reviewed as received in continuum and feedback sent to authors promptly. After the review process and subject to meeting the Terms of Acceptance, articles will be published immediately in the next issue of the journal. ATEPAN Special Issue is normally released as a collection of selected papers presented at the Annual National Conference of TEPAN. Every Special Issue focuses on the conference theme of that year. Topics of recent themes include TVET and Sustainable Development, National Security, and Entrepreneurship.

I have the pleasure to present to you and on behalf of the Editorial Board the Annals of Technology Education Practitioners Association of Nigeria, ATEPAN Volume 5 Issue 4 (December, 2022). This edition features high-quality scientific articles selected through a double-blind peer review process cut across the areas of teacher education, teaching methods, technologies and innovations, and issues in quality assurance and policies. We most sincerely express our gratitude to all our sponsors and other stakeholders for partnering with TEPAN to harness our collective educational and industrial experiences in Nigeria. Finally, I wish to thank all those who submitted their papers and my special thanks go to the journal Reviewers and Editorial Advisory for their valuable time and effort.

Thank you.



Dr. A. M. Hassan  
Editor – in – Chief

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**RELATIONSHIP BETWEEN ENTREPRENEURIAL BEHAVIOURAL ATTITUDES OF STUDENTS AND THEIR COMPETENCIES IN MACHINE WOODWORKING IN COLLEGES OF EDUCATION IN NORTH-WEST, NIGERIA**

Shiitu, B. K., Okwori, R. O., Mohammed, B. M. & Dauda, I.  
Department of Industrial and Technology Education  
Federal University of Technology, Minna  
Email: [shiitubk@gmail.com](mailto:shiitubk@gmail.com) (Tel: +2348035700607)

*Abstract:* The study established the relationship between entrepreneurial behavioural attitudes and competence in machine woodworking among woodwork technology education students in colleges of education in North-West, Nigeria. Three research questions were raised and answered as well as three null hypotheses were formulated and tested at 0.05 level of significance. Correlational research design was adopted for the study. The targeted population for the study was 70 Nigeria Certificate in Education (NCE) III technical education students from five Colleges of Education offering woodwork technology education in North-West Nigeria. The entire population was used for the study. The instruments used for data collection includes: Entrepreneurial Behavioural Attitude Inventory (EBAI) and Competence on Machine Woodworking Inventory (CMWI). The reliability of the instruments were established using Cronbach's Alpha statistics and yielded overall reliability coefficient of 0.924 and 0.816 respectively. The data collected were analyzed using Kendall's tau-b to answer all the research questions and Spearman's rho to test all the hypotheses at .05 level of significance. Findings from the study revealed among others strong positive relationship between: entrepreneurial behavioural attitudes and knowledge (.762), skills (.853) and attitudes (.798) towards machine woodworking among woodwork technology education students in colleges of education in North-West, Nigeria. Based on the findings, the study recommended among others that: conferences, workshops, seminars and other capacity building programmes should be organized by the Federal and State ministries of education in order to enhance the competence in machine woodworking lecturers which will positively reflect on the competence of the students and consequently improve their positive entrepreneurial behavioural attitudes.

**Keywords:** Entrepreneurial, Behavioural Attitudes, Competencies, Machine Woodworking

**Introduction**

In Nigeria today, government is making effort in a bid to see that students at all level of education irrespective of their programmes are economically empowered through entrepreneurship education. According to Adelaja *et al.* (2018), the aim of entrepreneurship education is to serve as a primary source of economic growth that creates business opportunities, reduces unemployment and offers better prospects for students. Adetola and Minai (2018) opined that, in spite of the good aim of entrepreneurship education, students of woodwork technology education express poor entrepreneurial behavioural attitudes.

Behavioural component of entrepreneurial attitudes could be seen as the behaviour of an individual that occurs as a result of feeling about entrepreneurship or entrepreneurial activities. The behavioural component is the intention, tendency or predisposition to behave in a certain manner toward entrepreneurship (Agarwal *et al.*, 2020). It is a person's tendencies to behave in a particular way toward entrepreneurship. Venkataraman (2017) stated that the intention to behave in a certain way toward entrepreneurship education depends on the cognitive and affective components.

Moreover, it is clearly indicated that, the components of entrepreneurial attitudes largely affects students' desire to start and maintain a business after graduation. Thus, poor entrepreneurial attitude amongst students kills the desire to start and maintain a business after graduation from school. Abimbola (2017) attributed the high rate of unemployment among graduates of technical education programmes including woodwork technology education in developing countries like Nigeria to poor entrepreneurial attitudes and competence in machine woodwork.

Competence in machine woodworking refers to the abilities of woodwork technology education students to operate portable power tools, perform advance woodworking machines operations, and carry out mass production of various items by using woodworking machines to succeed in the world of work. Ugwu *et al.* (2015) described competency in technical education and specifically in woodwork technology education to comprise three basic components that include attitude, skill and knowledge.

Knowledge means familiarity, awareness, or understanding of someone or something, such as facts, information, descriptions, or skills, which is acquired through experience or education by perceiving, discovering, or learning. Roberts and Dyer (2014) noted that, knowledge can be implicit or explicit. Knowledge of machine woodworking is highly required in order to succeed in the world of work. According to Selvi (2016), lack of theoretical or practical knowledge of a subject matter such as machine woodworking among woodwork technology education students translates into insufficient skill.

Skill in Machine Woodworking refers to the ability of students to perform operations using wood machineries such as tenoning, mortising, and moulding, surface planing, wood turning, thicknessing, and wood boring, sanding and finishing among others. Okeke (2022) stated that, lack of competence sufficient skills among woodwork technology education students which will trigger their entrepreneurial attitude is an issue of national discourse in Nigeria. Abimbola (2017) confirmed that, the lack of skills among technical education students attributed to several factors among which is students' entrepreneurial attitude. Hence, lack of skills of woodwork technology education students especially machining due to technology advancement can lead them to negativeitudinal change.

Attitude in this study could be seen as the mind-set of woodwork technology education students towards machine woodworking. Owino *et al.* (2015) reported that students' poor attitude towards a course such as machine woodworking may negatively affect students' competence in machines operation. This implied that positive attitude towards machine woodworking may positively influence woodwork technology education students' competence and increase their chances of venturing into entrepreneurship and becoming self-employed. Okwori (2017) argued that Colleges of Education graduates of woodwork technology education hardly setup their workshops due to poor technical skills that include machine woodworking. Hence, it is against this backdrop that this study sought to establish the relationship between entrepreneurial cognitive attitudes of students and their competencies in machine woodworking in colleges of education in North-West, Nigeria.

### **Statement of the Problem**

Machine woodworking is aimed at equipping woodwork technology education students with the technical skills in the use of machines to develop wood products such as furniture, doors, window frames and sills among others. Although, several efforts have been put in place in equipping students with the needed technical skills in machine woodworking, the competencies of students in the course is not encouraging. Nuffi (2018) revealed that the demonstrated competencies of woodwork technology education students in machine woodworking are low. The lack of competence by students in machine woodworking practically translates into lack of sufficient competency to function effectively in the world of work after graduation.

Several studies such as Okwori (2017), Samuel (2018) and Muhammad *et al.* (2020) attempted to address the lack of sufficient competence among students that led to consequent unemployment of technical education graduates. Despite these attempts, Salami (2019) revealed that competence of students in practical oriented courses such as machine woodworking and unemployment level among graduates remain discouraging. This entails that negative entrepreneurial behavioural attitudes could influence the lack of competences among woodwork technology education students

in machine woodworking. Hence, this study sought to establish whether entrepreneurial behavioural attitudes influence students' competence in machine woodworking.

### Purpose of the Study

The main purpose of the study was to determine the relationship between entrepreneurial behavioural attitudes and competence in machine woodworking among students of woodwork technology education in colleges of education in North-West, Nigeria. Specifically, the study determined the relationship between:

1. Students' behavioural entrepreneurial attitudes and knowledge in machine woodworking
2. Students' behavioural entrepreneurial attitudes and skills in machine woodworking
3. Students' behavioural entrepreneurial attitudes and their attitudes toward machine woodworking

### Research Questions

The study sought answers to the following research questions:

1. What is the relationship between students' behavioural entrepreneurial attitudes and knowledge in machine woodworking?
2. What is the relationship between students' behavioural entrepreneurial attitudes and skills in machine woodworking?
3. What is the relationship between students' behavioural entrepreneurial attitudes and their attitudes toward machine woodworking?

### Hypotheses

The following null hypotheses were formulated to guide the study and were tested at .05 level of significance:

- $H_{01}$ : There is no significant relationship between students' behavioural entrepreneurial attitudes and knowledge in machine woodworking
- $H_{02}$ : There is no significant relationship between students' behavioural entrepreneurial attitudes and skills in machine woodworking
- $H_{03}$ : There is no significant relationship between students' behavioural entrepreneurial attitudes and their attitudes toward machine woodworking?

### Methodology

Correlational research design was used for this study. According to Adi (2019), correlational research is a type of non-experimental research method in which a researcher measures two variables, understands and assess the statistical relationship between them with no influence from extraneous variable. The study was conducted in North-West, Nigeria. The population of the study was 70 Nigeria Certificate in Education (NCE) III technical education students from Five Colleges of Education offering woodwork technology education in North-West Nigeria. The Colleges of Education include Federal College of Education (Technical) Gusau, Shehu Shagari College of Education, Sokoto, College of Education, Kafanchan, Federal College of Education, Echi and Isah Kaita College of Education, Katsina. The study utilized the whole population due to its manageable size. Hence, there was no sampling in the study. Two instruments were developed that includes Entrepreneurial Behavioural Attitude Inventory (EBAI) and Competence in Machine Woodworking Inventory (CMWI) and were used for data collection. The instruments were face validated by three experts for construct and content validity. Cronbach's Alpha formular was used to determine the overall reliability coefficient values for EAI and CMWI were found to be 0.924 and 0.816 respectively. The study employed the use of Kendall's  $\tau_b$  to answer all the research questions and Spearman's rho to test the null hypotheses at .05 level of significance. Decision regarding the strength of association of Kendall's tau-b to answer research questions ranges from weak strength  $r < .3$ , medium strength  $r \leq .3$  to  $.5$  and strong strength  $r > .5$  respectively (Harry (2008). While decision regarding the interpretation of Spearman's rho to test the null hypotheses was based on comparing the Sig. two tailed value with p-value of 0.05. If the Sig. two tailed value attained is above the p-value of ( $<0.05$ ), it means there is no significant

relationship and the null hypotheses was upheld, where otherwise, it indicates there is significant relationship; consequently, the null hypothesis was rejected.

**Results:**

**Table 1: Kendall's tau b Concordance for the Test of Relationship between Students' Entrepreneurial Behavioural Attitudes and Knowledge in Machine Woodworking**

Variables		Knowledge	Behavioural
Knowledge	Correlation Coefficient	1.000	.762**
	N	70	70
Behavioural	Correlation Coefficient	.762**	1.000
	N	70	70

Table 1 shows the result for the test of relationship between students' entrepreneurial behavioural attitudes and knowledge in machine woodworking. The result shows the correlation coefficient between students' entrepreneurial behavioural attitudes and knowledge in machine woodworking is .762. The correlation coefficient value signifies strong positive relationship between students' entrepreneurial behavioural attitudes and knowledge in machine woodworking.

**Table 2: Kendall's tau b Coefficient of Concordance for the Test of Relationship between Students' Entrepreneurial Behavioural Attitudes and Skills in Machine Woodworking**

Variables		Skills	Behavioural
Skills	Correlation Coefficient	1.000	.853**
	N	70	70
Behavioural	Correlation Coefficient	.853**	1.000
	N	70	70

The result for the test of relationship between students' entrepreneurial behavioural attitudes and skills in machine woodworking is shown in Table 2. The result shows the correlation coefficient value of .853 for the relationship between students' entrepreneurial behavioural attitudes and skills in machine woodworking. The correlation coefficient value signifies strong positive relationship between students' entrepreneurial behavioural attitudes and skills in machine woodworking.

**Table 3: Kendall's tau b Coefficient of Concordance for the Test of Relationship between Students' Entrepreneurial Behavioural Attitudes and their Attitudes toward Machine Woodworking**

Variables		Attitude	Behavioural
Attitude	Correlation Coefficient	1.000	.798**
	N	70	70
Behavioural	Correlation Coefficient	.798**	1.000
	N	70	70

Table 3 shows the result for the test of relationship between entrepreneurial behavioural attitudes and their attitudes toward machine woodworking. The result shows the correlation coefficient between entrepreneurial behavioural attitudes and their attitudes toward machine woodworking is .873. The correlation coefficient value signifies strong positive relationship between entrepreneurial behavioural attitudes and their attitudes toward machine woodworking.

**Table 4: Spearman's rho Coefficient of Concordance for the Test of Significant Relationship between Students' Entrepreneurial behavioural Attitudes and Knowledge in Machine Woodworking**

Variables		Knowledge	Behavioural
Spearman's rho	Knowledge	Sig. (2-tailed)	.000
	N	70	70
Spearman's rho	Behavioural	Sig. (2-tailed)	.000
	N	70	70

\*\* Correlation is significant at the <0.05 level (2-tailed).

Table 4 shows the result for the test of significant relationship between students' entrepreneurial behavioural attitudes and knowledge in machine woodworking. The significant (2-tailed) value of .000 was revealed which is less than the stated level of significant (0.05). Based on the test result, it implied that there is significant relationship between students' entrepreneurial behavioural attitudes and knowledge in machine woodworking. Therefore, the null hypothesis is rejected.

**Table 5: Spearman's rho Coefficient of Concordance for the Test of Significant Relationship between Students' Entrepreneurial behavioural Attitudes and Skills in Machine Woodworking**

Variables		Skills	Behavioural
Spearman's rho	Skills	Sig. (2-tailed)	.000
		N	70
	Behavioural	Sig. (2-tailed)	.000
		N	70

\*\*\* Correlation is significant at the <0.05 level (2-tailed).

The result for the test of significant relationship between students' entrepreneurial behavioural attitudes and skills in machine woodworking is presented in Table 5. The result shows the significant (2-tailed) value of .000 which is less than the stated level of significant (0.05). This indicated that there is significant relationship between students' entrepreneurial behavioural attitudes and skills in machine woodworking. Therefore, the null hypothesis is rejected.

**Table 6: Spearman's rho Coefficient of Concordance for the Test of Significant Relationship between Students' Entrepreneurial behavioural Attitudes and their Attitudes toward Machine Woodworking**

Variables		Behavioural	Attitude
Spearman's rho	Behavioural	Sig. (2-tailed)	.000
		N	70
	Attitude	Sig. (2-tailed)	.000
		N	70

\*\*\* Correlation is significant at the <0.05 level (2-tailed).

The test result for testing the significant relationship between students' entrepreneurial behavioural attitudes and their attitudes toward machine woodworking is contained in Table 6. The results revealed the significant (2-tailed) value of .000 which is less than the stated level of significant (0.05). This implied that there is significant relationship between students' entrepreneurial behavioural attitudes and their attitudes toward machine woodworking. As a result, the null hypothesis is rejected.

**Findings**

1. There was strong positive relationship between students' behavioural entrepreneurial attitudes and knowledge in machine woodworking.
2. Students' behavioural entrepreneurial attitudes and skills in machine woodworking exhibited strong positive relationship.
3. The relationship between students' behavioural entrepreneurial attitudes and their attitudes toward machine woodworking was positively strong.
4. There was significant relationship between students' behavioural entrepreneurial attitudes and knowledge in machine woodworking.
5. Students' behavioural entrepreneurial attitudes and skills in machine woodworking was significant.

6. The relationship between students' behavioural entrepreneurial attitudes and their attitudes toward machine woodworking was significant.

### Discussion of Findings

The relationship between students' entrepreneurial behavioural attitudes and knowledge in machine woodworking was found to be strong positive relationship. The finding is in support of Owino *et al.* (2015) that knowledge is the most powerful instrument that shapes human understanding and behaviour towards a particular phenomenon. This implied that positive behaviour towards a given phenomenon is more likely to be achieved with high knowledge. This position is further supported by Adetola and Minai (2018) who predicted that entrepreneurial attitudes and intentions among Nigerian undergraduate students are largely determined by knowledge. This could be seen as knowledge in machine woodworking is closely related to entrepreneurial behavioural attitudes of students in the sense that acquisition and development of knowledge can positively influence and shape one's behaviour. Hence, it is rational to literarily conclude that knowledge in machine woodworking positively relate to the entrepreneurial behavioural attitudes of students.

Additionally, finding on the test for significant relationship between students' entrepreneurial behavioural attitudes and knowledge in machine woodworking revealed a positive significant relationship. The finding is related to the finding of Mesfin and Shumet (2018) that showed entrepreneurial education/training and entrepreneurial attitudes significantly predicts students' self-employment intention among engineering students in Bahir Dar Institute of Technology, Debre Markos University and University of Gondar, Ethiopia. Najafi and Esuh (2014) supported the assertion that there is often a significant relationship between behavioural and knowledge. Thus, other components of competence that include skills and attitude components have a unique role to play in the formation of positive attitudes towards entrepreneurial activities.

The relationship between students' entrepreneurial behavioural attitudes and skills in machine woodworking was found to be strong positive relationship. The finding is in support of the view of Owino *et al.* (2015) that argued skills is the most powerful instrument that shapes human understanding and behaviour towards a particular phenomenon. This implied that high skills in a particular field of endeavour are likely to cause positive behaviour towards a given phenomenon. Furthermore, the postulations of Adetola and Minai (2018) further supported the finding by revealing that entrepreneurial attitudes and intentions among Nigerian undergraduate students are largely determined by skills. This could be seen as skills in machine woodworking is closely related to entrepreneurial behavioural attitudes of students in the sense that acquisition and development of skills can positively influence and shape one's behaviour. Hence, it is rational to literarily conclude that skills in machine woodworking positively relate to the entrepreneurial behavioural attitudes of students.

Moreover, a positive significant relationship was found as regard to the test for significant relationship between students' entrepreneurial behavioural attitudes and skills in machine woodworking. The finding is related to the finding of Mesfin and Shumet (2018) that showed entrepreneurial education/training and entrepreneurial attitudes significantly predicts students' self-employment intention among engineering students in Bahir Dar Institute of Technology, Debre Markos University and University of Gondar, Ethiopia. Najafi and Esuh (2014) supported the assertion that there is often a significant relationship between behavioural and skills. The reason for the significant relationship could be attributed to the important and strong connection between entrepreneurial behavioural attitudes and skills in machine woodworking.

The relationship between students' entrepreneurial behavioural attitudes and attitudes toward machine woodworking was found to be strong positive relationship. The finding is supporting the view of Owino *et al.* (2015) that says attitude is the most powerful instrument that shapes human understanding and behaviour towards a given phenomenon. This finding is further supported by

Adenola and Minai (2018) who predicted that entrepreneurial attitudes and intentions among Nigerian undergraduate students are largely determined by their attitudes toward learning. This could be seen as attitudes towards machine woodworking is closely related to entrepreneurial behavioural attitudes of students in the sense that acquisition of positive attitudes can positively influence and shape one's behaviour. Hence, it is a valid view point to see attitudes toward machine woodworking positively relate to the entrepreneurial behavioural attitudes of students.

Additionally, the test for significant relationship between students' entrepreneurial behavioural attitudes and attitudes toward machine woodworking revealed a positive significant relationship. The finding is related to the finding of Mesfin and Shumet (2018) that showed entrepreneurial attitudes significantly predicts students' self-employment intention of engineering students in Bahir Dar Institute of Technology, Debre Markos University and University of Gondar, Ethiopia. Najafi and Esuh (2014) supported the assertion that there is often a significant relationship between behavioural and attitudes. Thus, it is important to consider attitude and other components of competence that include knowledge and skills as strong indicator in the establishment of positive attitudes towards entrepreneurial activities.

### Conclusion

The study found a positive and significant relationship between entrepreneurial behavioural attitudes and competence in machine woodworking among students of woodwork technology education in Colleges of Education in North-West, Nigeria. In essence, the behavioural components of entrepreneurial attitudes are determined by the knowledge, skills and attitudes that students acquired in machine woodworking. This implied that students with entrepreneurial mind-set are likely to bring innovation, risk-taking, and business growth opportunities to the field of machine woodworking. Hence, it is concluded that the entrepreneurial behavioural attitudes of woodwork technology education students could be enhanced with the appropriate knowledge, skills and attitudes of machine woodworking acquired in schools.

### Recommendations

Based on the findings of the research, the following recommendations were made:

1. Conferences, workshops, seminars and other capacity building programmes should be organized by the Federal and State Ministries of Education in order to enhance the knowledge of machine woodworking lecturers which will positively reflect on the knowledge of the students and consequently improve their positive entrepreneurial behavioural attitudes.
2. The Federal and State Ministries of Education should ensure the availability of adequate human and material resources for teaching and learning woodwork technology education that can guarantee skills acquisition in machine woodworking among students and also boast their entrepreneurial behavioural attitudes.
3. The Federal and State Ministries of Education should improve on the existing funding to ensure the availability of adequate human and material resources in woodwork technology education which will enhance the process of teaching and learning, promote positive attitudes towards machine woodworking and consequently, improve positive entrepreneurial behavioural attitudes among students.

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